

## ABSTRACT OF THE DISCLOSURE

A method for single molecule identification of a target DNA molecule in a random coil state having the following steps: a) attaching an  
5 optically distinguishable material to a DNA sequence recognition unit; b)  
hybridizing the DNA sequence recognition unit to the target DNA molecule in a  
random coil state to form a hybridized DNA complex in a random coil state; c)  
stretching the hybridized DNA complex in a random coil state to form a  
hybridized DNA complex in a substantially linear configuration; and d) detecting  
10 the optically distinguishable material in a sequential manner along the  
substantially linear hybridized DNA complex, thereby identifying the target DNA  
molecule.

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